AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/DE 03/00694 filed on March 3, 2003.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0001] with the following amended paragraph:

[0001] ~~Prior Art~~ Field of the Invention

Please replace paragraph [0002] with the following amended paragraph:

[0002] The invention is ~~based on a~~ directed to an improved fuel injection valve for an internal combustion engine. ~~as generically defined by the preamble to claim 1. Fuel injection valves of this kind are known, for example, from the patent application DE 100 24 703 A1. Fuel injection valves of this kind have a housing that contains a moving valve element whose movement counter to the elastic force of a spring element controls the fuel supply to the combustion chamber of the engine. The valve element is frequently in the form of a valve needle that has a longitudinal axis and moves in the direction of this longitudinal axis. The spring element is embodied as a helical compression spring disposed coaxial to the valve element in the housing. The known helical compression spring, however, has the disadvantage that in order to be able to provide the necessary rigidity, it must be wound using relatively thick wire and therefore takes up a relatively large amount of space. This constitutes a limitation to further narrowing of fuel injection valves that cannot be surpassed because of the high fuel pressure prevailing there.~~

Please add the following new paragraph after paragraph [0002]:

[0002.4] Description of the Prior Art

Please add the following new paragraph after paragraph [0002.4]:

[0002.6] Fuel injection valves of the type with which this invention is concerned are known, for example, from the patent application DE 100 24 703 A1. Fuel injection valves of this kind have a housing that contains a moving valve element whose movement counter to the elastic force of a spring element controls the fuel supply to the combustion chamber of the engine. The valve element is frequently in the form of a valve needle that has a longitudinal axis and moves in the direction of this longitudinal axis. The spring element is embodied as a helical compression spring disposed coaxial to the valve element in the housing. The known helical compression spring, however, has the disadvantage that in order to be able to provide the necessary rigidity, it must be wound using relatively thick wire and therefore takes up a relatively large amount of space. This constitutes a limitation to further narrowing of fuel injection valves that cannot be surpassed because of the high fuel pressure prevailing there.

Please replace paragraph [0003] with the following amended paragraph:

[0003] ~~**Advantages of the Invention**~~ SUMMARY AND ADVANTAGES OF INVENTION

Please replace paragraph [0004] with the following amended paragraph:

[0004] The fuel injection valve according to the invention~~**, with the characterizing features of claim 1,**~~ has the advantage over the prior art that the spring element used here, which is embodied in the form of a cylindrical sleeve, provides the same rigidity while requiring less space than a corresponding helical compression spring, thus allowing the outer diameter of the fuel injection valve to be correspondingly reduced. The cylindrical sleeve of the spring element has openings at a number of locations in its wall, which allow the cylindrical sleeve to be elastically deformed in the longitudinal direction.

Page 2, please replace paragraph [0005] with the following amended paragraph:

[0005] Advantageous embodiments of the subject of the invention are possible ~~by means of the dependent claims~~. A favorable longitudinal elasticity of the cylindrical sleeve can be easily achieved through the layout of the openings, which essentially extend in a radial plane of the cylindrical sleeve. It is particularly advantageous here if two similar openings are disposed in a radial plane and are divided from each other by connecting pieces. The elasticity of the cylindrical sleeve can be adjusted very easily by means of the thickness of these connecting pieces. When two openings are provided in a radial plane, it is particularly advantageous if the openings of the immediately adjacent radial planes are rotated by 90° in relation to one another.

Page 3, please delete paragraph [0007].

Please replace paragraph [0008] with the following amended paragraph:

[0008] ~~Drawings~~ BRIEF DESCRIPTION OF THE DRAWINGS

Please replace paragraph [0009] with the following amended paragraph:

[0009] ~~An exemplary embodiment of the fuel injection valve according to the invention is shown in the drawings.~~ Other features and embodiments will become apparent from the description contained herein below, taken in conjunction with the drawings, in which:

Please replace paragraph [0010] with the following amended paragraph:

[0010] Fig. 1shows a longitudinal section through a prior art fuel injection valve ~~according to the invention~~,

Please replace paragraph [0011] with the following amended paragraph:

[0011] Fig. 2 is a perspective sectional view of ~~the~~ a valve body according to the invention; the valve element has been omitted for the sake of visibility,

Please replace paragraph [0012] with the following amended paragraph:

[0012] Fig. 3 is an enlarged depiction of the spring element of Fig. 2 with a sleeve attached to it,

Page 4, please replace paragraph [0015] with the following amended paragraph:

[0015] ~~Description of the Exemplary Embodiments~~

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please replace paragraph [0016] with the following amended paragraph:

[0016] Fig. 1 shows a longitudinal section through a prior art fuel injection valve ~~according to the invention. The fuel injection~~ in which the valve has a housing 1 that has a valve-holding body 3 and a valve body 5 that are clamped against each other in the axial direction by a retaining nut 7. The valve body 5 contains a bore 10 that has a longitudinal axis 14; a piston-shaped valve element 12 is contained so that it can slide longitudinally in the bore 10. At its end oriented away from the combustion chamber, the bore 10 widens out to form an inner chamber 9 that is connected to a supply conduit 21 embodied in the valve-holding body 3. The valve element 12 is guided in a middle bore section 110 of the bore 10 and a pressure chamber 18 in the form of an annular conduit is formed between the valve element 12 and the wall of the bore 10 and can be filled with highly pressurized fuel via the supply conduit 21 and the inner chamber 9. The guided section of the valve element 12 is provided with four ground surfaces 16 that make it possible for the fuel to flow from the inner chamber 9, between the valve element 12 and the wall of the bore 10, and into the pressure chamber 18. At the end of the bore 10 protruding into the combustion chamber 6 of the engine, a valve seat 20 is provided, which is conically shaped and cooperates with a valve-sealing surface 24 embodied at the combustion chamber end of the valve element 12 in such a way that when the

valve-sealing surface 24 is lifted away from the valve seat 20, fuel can flow out of the pressure chamber 18, between the valve-sealing surface 24 and the valve seat 20, to injection openings 22 provided in the valve body 5, through which the fuel is injected into the combustion chamber 6 of the engine. If the valve-sealing surface 24 is resting against the valve seat 20, then the injection openings 22 are closed so that this fuel flow is interrupted.

Page 5, please replace paragraph [0017] with the following amended paragraph:

[0017] The inner chamber 9 contains a sleeve 34, a spring element 30, and a spring plate 32, which encompass the end section of the valve element 12 oriented away from the combustion chamber. The end surface 13 of the valve element 12 oriented away from the combustion chamber, the valve-holding body 3, and the sleeve 34 encompassing the valve element 12 delimit a control chamber 37 into which highly pressurized fuel can be conveyed via a central control bore 40 embodied in the valve-holding body 3. The spring element 30 is disposed between the sleeve 34 and the spring plate 32 under a compressive initial stress that pushes the sleeve 34 and the spring plate 32 apart from each other. Since the spring plate 32 is supported on the valve element, this presses the valve element 12 against the valve seat 20.

Please replace paragraph [0018] with the following amended paragraph:

[0018] The longitudinal movement of the valve element 12 is controlled by means of the hydraulic pressure in the pressure chamber 18 and the pressure in the control chamber 37. During operation of the internal combustion engine, a continuous high fuel pressure prevails in the pressure chamber 18, which generates a hydraulic force on a pressure shoulder 17 that is formed at the transition from the section of the valve element 12 oriented toward the combustion chamber into the guided section in the region of the ground surfaces 16. This exerts an opening force on the valve element 12 that is directed away from the valve seat 20.

This opening force works in opposition to the force of the prestressed spring element 30 and the hydraulic closing force that the pressure in the ~~pressure~~ control chamber 37 exerts on the end 13 of the valve element 12. If a high fuel pressure prevails in the ~~pressure~~ control chamber 37, then the valve element 12 is held in its closed position since the hydraulically effective area of the pressure shoulder 17 is significantly smaller than that of the end surface 13 of the valve element 12. If the pressure in the control chamber 37 is relieved via the control bore 40, then the hydraulic force on the pressure shoulder 17 moves the valve element 12 away from the valve seat 20 counter to the force of the spring element 30 so that fuel is injected through the injection openings 22 into the combustion chamber 6 of the engine in the above-described manner. Since pressures of more than 100 MPa can prevail in the pressure chamber 18 and the control chamber 37, the force of the spring element 30 only plays a secondary role in the opening stroke motion of the valve element 12. The spring element 30 mainly serves to keep the valve element 12 in the closed position when the internal combustion engine is not running and there is no fuel pressure in the pressure chamber 18 and in the control chamber 37.

Page 6, please replace paragraph [0019] with the following amended paragraph:

[0019] Fig. 2 is a perspective, sectional view of the valve body 5 ~~in the region of the~~ embodying a spring element 30 according to the invention. The valve element 12 here has been omitted for the sake of visibility. The sleeve 34 is embodied of one piece with the spring element 30, thus eliminating the contact surface between these two parts. Fig. 3 shows an enlarged depiction of the spring element 30, together with the sleeve 34 and a ring element 42 that adjoins the elastic element 30 at the end oriented away from the sleeve 34 and supports the spring element 30 directly against the valve element 12. The ring element 42

here can likewise be of one piece with the spring element 30 or can be embodied as a separate component that is attached to the spring element 30, e.g. by means of welding or soldering. The spring element 30 is embodied as a cylindrical sleeve that has a number of openings 45 in its wall, which allow the spring element 30 to be elastically deformed in the longitudinal direction. The precise design of the spring element 30 embodied as a cylindrical sleeve is shown in Fig. 4; the spring element 30 here is shown in the unloaded state and in this instance, is produced as a separate component without the sleeve 34 and the ring element 42. The openings 45 of the spring element 30 are embodied in the form of slots and have a longitudinal axis 52 that extends in a radial plane in relation to the longitudinal axis 14 of the spring element 30. The ends 47 of the slot-shaped openings 45 are rounded in order to reduce the notching stresses that occur in them when the spring element 30 is compressed. A plastic deformation of the material at the ends 47 of the openings 45 must be definitely prevented in order to maintain the rigidity of the spring element 30 over its entire service life. Otherwise, the spring element 30 would be irreversibly deformed, which would alter its rigidity.

Page 8, please replace paragraph [0023] with the following amended paragraph:

[0023] In addition to using the spring element 30 to act on a valve element 12, the spring element 30 according to the invention can also be used in other locations in a fuel injection valve where space is limited and the spring element must take up the smallest amount of space possible. Other possible exemplary embodiments include solenoid valves in fuel injection valves.

Please add the following new paragraph after paragraph [0023]:

[0024] The foregoing relates to preferred exemplary embodiments of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.